2017 Central Valley Flood Protection Plan Update

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Today's Discussion

Where We've Been

- DWR's RFMP Phase 1 Content Review

Where We Are

- Long-Term OMRR&R Workgroup Overview

Where We're Going

- Basin-Wide Feasibility Study Atlases: Update

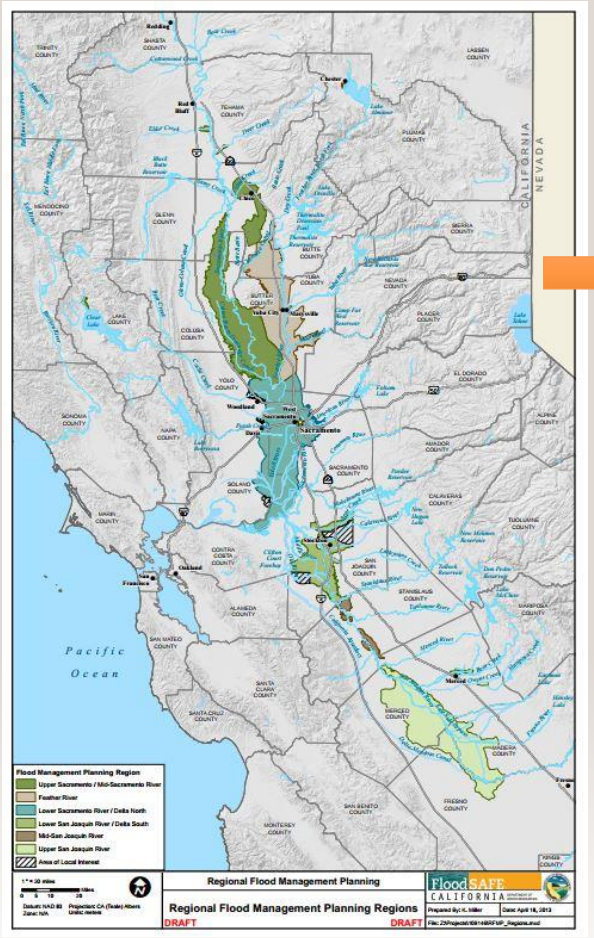
Where We've Been

DWR's RFMP Phase 1 Content Review

2017 CVFPP Update

Chapter 1 Context	Setting Historical Context
Chapter 2 Converging	Summary of Refinements and Areas of Alignment
Chapter 3 System Management	Strategies to Improve System Management
Chapter 4 Implementation Timing	Investment Approach
Chapter 5 Measuring Value	Tracking, Reporting of Investment Actions & Results

One Process, Many Activities



CVFPP Assessment

- BWFS System Performance Analysis
- RFMP Regional Visions and Priorities
- Conservation Strategy
- O&M
- Safety & Risk
- Climate Change
- Long-term Economic Consequences of Flooding
- USACE Feasibility Studies

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RFMP Content Review Activities

Chapter 2 Converging

Chapter 3 System Management

1. **DWR/RFMP Listening Tour**
2. **Review of Regional Plans**
3. **Review of Projects Identified in Regional Plans**

February-May 2015

4. **Continued Discussions and Dialogue** – *Ongoing*

DWR/RFMP Listening Tour

Chapter 2 Converging

Chapter 3 System Management

- Series of DWR/ RFMP meetings planned
- Opportunity to:
  - Enhance DWR's understanding of regional challenges, opportunities and priorities
  - Discuss regional plans and RFMP integration into 2017 Update and future planning
  - View proposed project sites
  - See region "through RFMP eyes"
  - Continue open dialogue

What are we looking for?

Chapter 2 Converging

Chapter 3 System Management

- **Plan Consistency:** Scope of Phase 1 RFMPs; CVFPP priorities
- **Detail About Regional Needs:** Proposed regional flood improvements, management actions, policy recommendations
- **Project Specifics:** Benefits (local, interregional, systemwide), timing, anticipated costs and potential funding source(s)
- **Trends:** Commonality between regions' opportunities/challenges, priorities, management actions and projects
- **Bundling Opportunities:** Opportunities to strategically combine projects regional, interregional, systemwide
- **Linkage to State Priorities, Integration Opportunities:** 2017 Update and future planning; how regional improvements add to overall system performance

RFMP Review– Initial Findings

Sacramento River Basin RFMPs

Trends:

- Significant agricultural land use
- Plans have project prioritization
- Plans focus on potential for multi-benefit projects
- Plans focus on reservoir and bypass improvements

San Joaquin River Basin RFMPs

Trends:

- Significant agricultural land use
- Plans have multi-step, tiered project prioritization
- Sizeable DAC presence
- Projects are smaller, more localized in scale (levees)

RFMP Review– Initial Findings

Regional Plan	Total Number of Projects	Percentage of Projects Without Estimated Costs	Total Estimated Project Costs, in Billions
Feather River	98	12%	$2.2
Upper/Mid-Sacramento River	760	N/A	$4.3
Lower Sacramento River and Delta North	130	24%	$3.6
Lower San Joaquin River and Delta South	137	0%	$3.0
Mid-San Joaquin River	37	0%	$0.3
Upper San Joaquin River	88	13%	$1.7*
TOTAL	1,250		$15.1

Notes:
1) Results based on preliminary reviews of the RFMPs
2) N/A = costs are not associated with the 760 local projects, costs are associated with region wide projects
3) *= Includes approximately $984 million that will be funded through the San Joaquin River Restoration Program

Where We Are

Long-Term OMRR&R Workgroup Overview

Long-Term OMRR&R Workgroup

The Need

- True Cost of OMRR&R

The Approach

- What We Did (and Why)

The Results

- Crunching and Sorting the Data

Recommendations

- Path Toward Sustainable OMRR&R

Workgroup Members

Members include consultants and DWR staff from FMO, CVFPO, HAFOO, FESSRO and SIIB

Christopher Williams
Mark Oliver
Tom Engler
Natasha Nelson
Mark List
Pavel Kazi
Shelly Amrhein
Kristin Reardon
Laura Byrd
Jordan Vazquez
David Christophel
Eric McGrath
Kristin Richmond
Josh Brown
Shem Stygar
Pete Rude
Jeff Tupen
Steve Cowdin

The Need

True Cost of OMRR&R

The Need

- 2012 CVFPP, AB 156 and USACE "simple" estimates are outdated and generally inaccurate
- Reasonable "true cost" estimates – identify all needs
  - O&M and RR&R – very different categories addressed, but related
  - Long-term (50 year+) evaluation
- Repeatable and defensible method
- Expose the OMRR&R funding shortfall
- Account for and integrate environmental concerns
- Identify real-world permitting and mitigation costs

Objectives of the Workgroup

- Develop strategy and approach for estimating long-term OMRR&R costs
- Develop unit and overall cost assumptions for OMRR&R activities for levees, channels and structures
  - Overall DWR and LMA need
  - Support the ability to compare BWFS configurations
- Identify all necessary OMRR&R activities and associated costs required to create a sustainable system
- Address the potential costs for environmental compliance/mitigation requirements in our assumptions
- Provide recommendations to support improved OMRR&R (including necessary next steps)
- Document all findings in a technical memorandum (TM)

Sections of Technical Memorandum

Section 1: Introduction

Section 2: Background

Section 3: Factors Influencing OMRR&R Costs

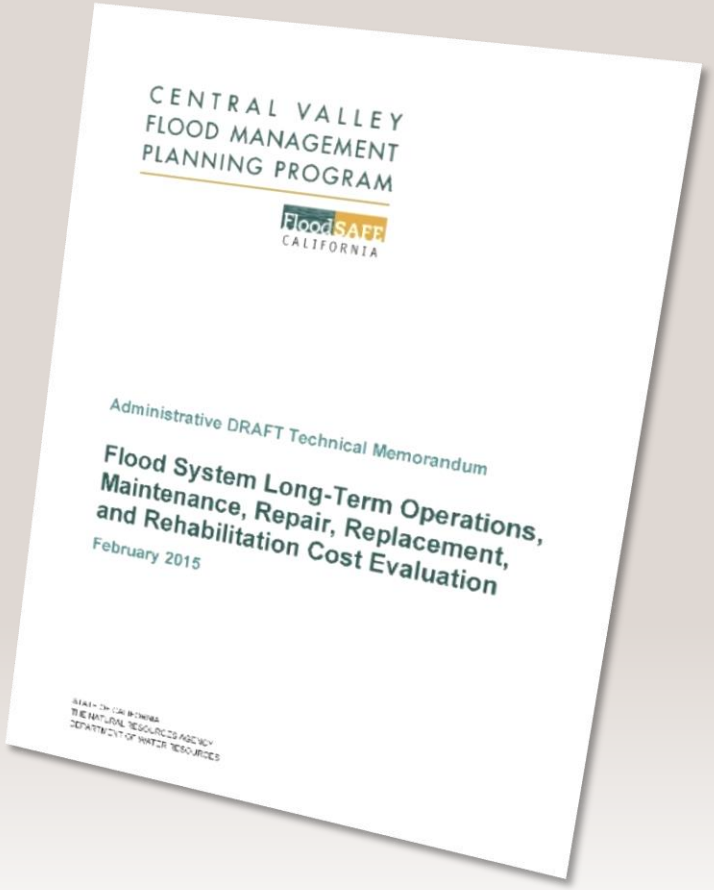
Section 4: Current OMRR&R Activities and Practices

Section 5: Approach for Estimating Long-Term OMRR&R Costs

Section 6: Sacramento and San Joaquin Basins

Section 7: Potential Funding Sources

Section 8: Recommendations and Next Steps



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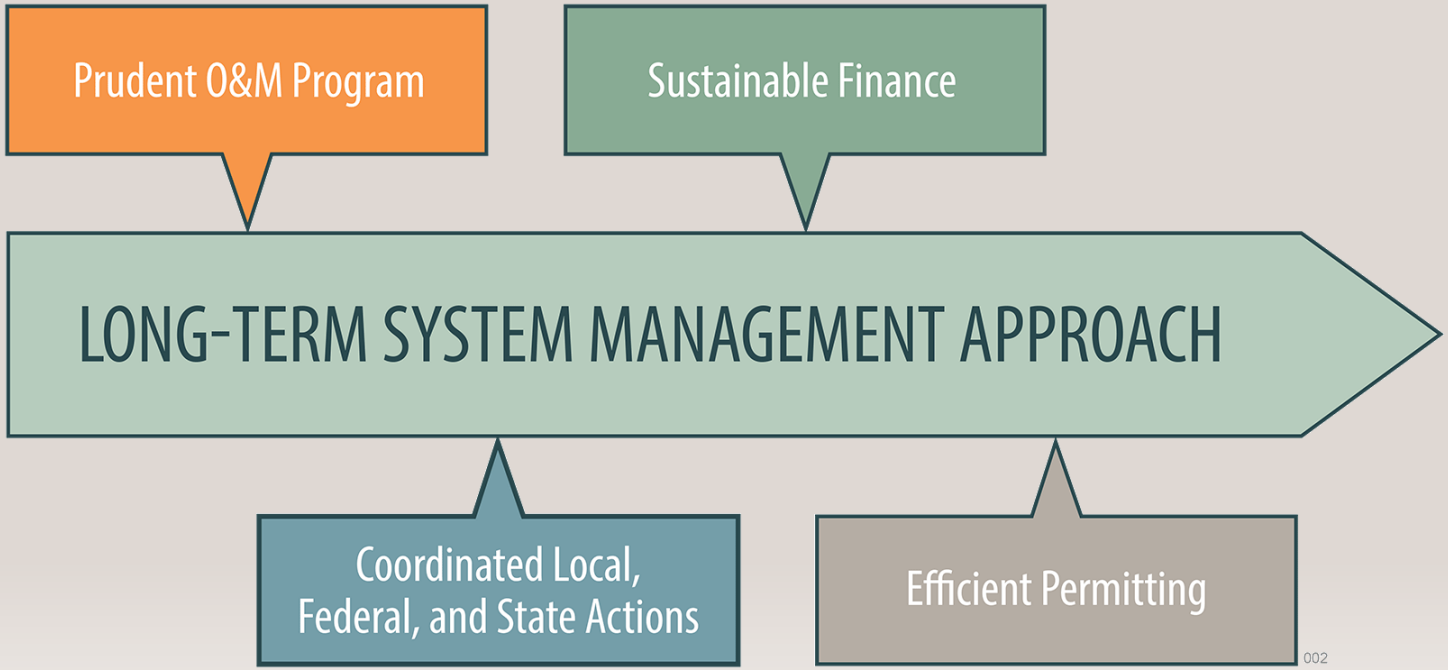
A Systemwide Approach: One Process, Many Activities



The Approach

What We Did (and Why)

The Approach

- Develop unit and long-term true cost (including RR&R costs)
- Evaluate existing sources and gather additional information as necessary
- Break down costs by appropriate categories (both O&M and RR&R) in Sacramento and San Joaquin river basins:
  - Levees
  - Channel sediment and vegetation removal
  - Minor structures
  - Major structures (repair "R" accounts for anticipated longevity)

Past Approaches and Efforts

DWR

- Working Draft Flood System O&M Cost Assessment (August 2010)
- O&M Roles and Responsibilities (April 2012)

LMAs

- AB156 data (since 2008)

USACE

- No single consistent approach

Data Sources/Cost Categories

Data Sources

- AB 156 data (determined to be unreliable for our purposes)
- LMA questionnaire
- DWR staff
- LMA interviews/calls
- Delta Subventions
- Sac Bank

Breakdown of Costs: O&M Versus RR&R

- Levees (urban/non-urban)
- Sediment and vegetation removal (O&M only)
- Small structures (e.g., pipe inspections, abandonment or replacement)
- Large structures (e.g., weirs, gates)
- Transactional

Conservative Approach for Identifying True OMRR&R Costs

Category	SPFC O&M Costs – Sources Used	SPFC RR&R Costs – Sources Used
Urban levees	LMA questionnaire (Sac) LMA interviews (SJ)	Delta Subventions Urban Levee Design Criteria
Non-urban levees	Delta Subventions LMA questionnaire LMA interviews	Delta Subventions
Sediment/vegetation removal	DWR yards (Sac) LMA interviews (SJ)	N/A
Minor structures	Utility Crossing Inventory Program DWR staff LMA interviews	Recent DWR costs
Major structures	DWR staff LMA interviews	Agreed TBD given future life cycles

OMRR&R Cost Categories (1 of 3)

	JOB CATEGORY	Average Annual Cost Per Mile Urban	Average Annual Cost Per Mile Non-Urban
J1	**Payroll** Salaries, Benefits, Worker's Comp, and Unemployment Insurance	$3,324	$1,029
J2	**Maintenance Yard Overhead** insurance, elections, taxes, etc.	$675	$444
J3	**Vegetation Control** burning, mowing, grazing, dragging	$1,429	$831
J4	**Rodent Control** baiting, trapping, grouting, backfilling	$436	$596
J5	**Patrolling** High water patrols, security monitoring	$0	$0
J6	**Inspections** every 90 days minimum	$1,910	$1,065

OMRR&R Cost Categories (2 of 3)

	JOB CATEGORY	Average Annual Cost Per Mile Urban	Average Annual Cost Per Mile Non-Urban
J7	**Crown Roadways** gravel replenishment, grading	$939	$426
J8	**Encroachment Management** fences, stairs, pipes, remediation plans	$4,208	$1,573
J9	**Minor Structure Maintenance** gates, signs, concrete, flap gates, stop logs/closure structures	$120	$0
J10	**Major Restoration/Repair** erosion repairs, pipe replacemen, seepage/stability	$0	$7,853
J11	**Equipment Costs** purchase, rentals, maintenance, fuel	$771	$463
J12	**Pumping Plants** Operations, maintenance, repairs	$1,757	$4,289

OMRR&R Cost Categories (3 of 3)

	JOB CATEGORY	Average Annual Cost Per Mile Urban	Average Annual Cost Per Mile Non-Urban
J13	**Environmental Compliance** permits, MOU's, regulatory fees not captured in other job categories	$6,575	$2,651
J14	**Instrumentation Maintenance** piezometers, relief wells	$21,305	$11,373
J15	**Channel Maintenance** Sediment and Vegetation removal and maintenance	$451	$323
J16	**Urban Levee Design Criteria Requirements** Flood Safety and Security Plans, Vegetation Evaluation and Inspections, Right of Way and Land Use Plans, and Flood Relief Structure Plans	$1,682	$0
J17	**Capital Replacement Fund** Pipes, Pumps, Structures, Equipment, Tools, etc.	$2,797	$1,259
J18	**Emergency Reserve Fund** Contingency Fund for Unforeseen Events	$2,849	$2,342
Average LMA Cost Per Mile		$28,188	$16,057

The Results

Crunching and Sorting the Data

Operation and Maintenance Costs

Suggested Unit Cost (Sacramento, San Joaquin)

- Levee maintenance:
  - Urban: $22,000/mile, $33,000/mile
  - Non-urban: $13,000/mile, $5,000/mile
- Channel maintenance:
  - Sediment removal: $10/CY, $5/CY
  - Vegetation and debris: $800/acre, $400/acre
- Minor structures: $430,000/year
- Major structures: $530,000/year, $52,000/year

Repair, Replacement, and Rehabilitation

Suggested Unit Cost (Sacramento and San Joaquin)

- Levee maintenance:
  - Urban: $18,000/mile
  - Non-urban: $13,000/mile
- Minor structures: $28,000,000/year
- Major structures: N/A – useful life >50 years

Transactional Costs

TM Discusses

- CEQA and NEPA
- Process for regulatory agency approval
- Section 408 permission

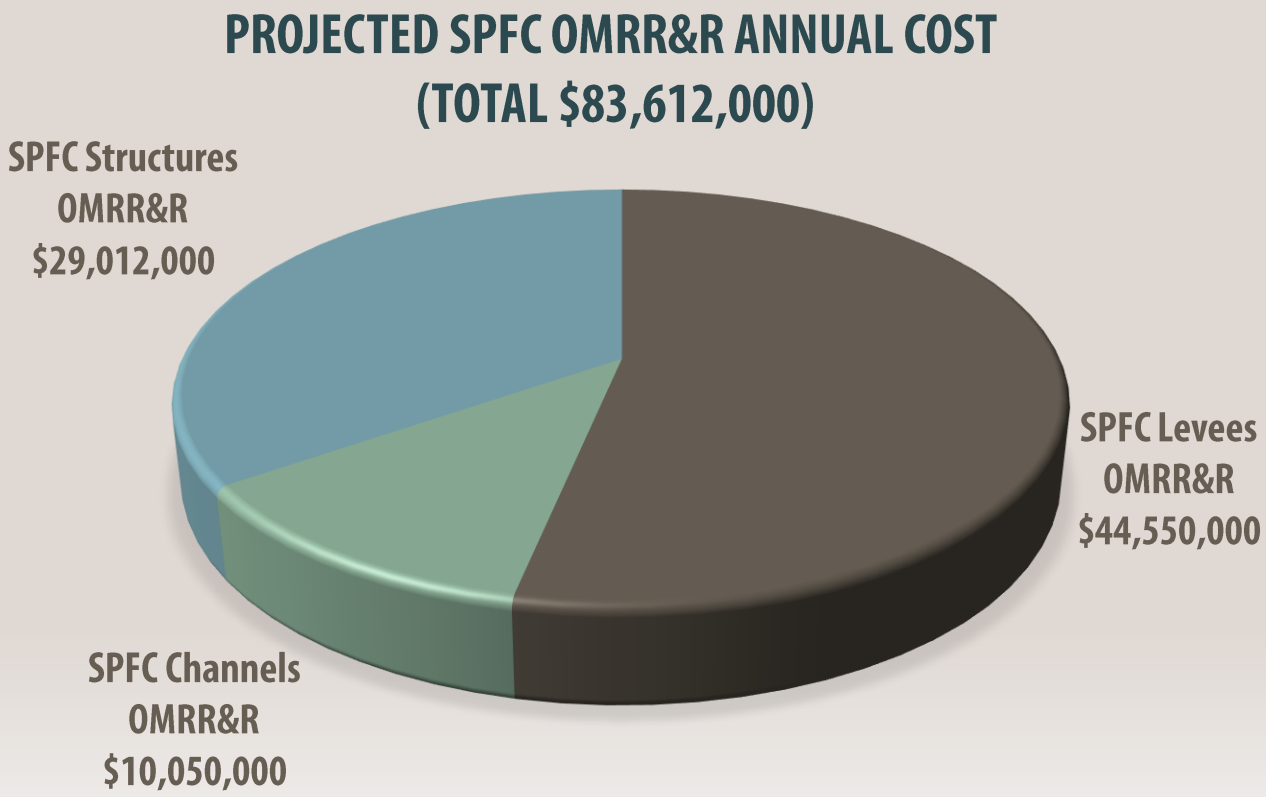
Findings

- Transactional costs can be a high percentage of a budget
- Wide variation makes prediction difficult
- Programmatic permits should continue to be explored (saves time and money)

Totals and Comparisons

SPFC Projected OMRR&R Annual Costs		
Description	Unit	**Annual Cost**
OMRR&R on SPFC Levees	1,680 miles	**$44,550,000**
OMRR&R on SPFC Channels	5,500 acres	**$10,050,000**
OMRR&R on SPFC Structures	N/A	**$29,012,000**
Total annual cost		**$83,612,000**
Estimated current annual reported spending (based on AB 156 data)		**$23 to $27 Million**

Totals and Comparisons



Findings

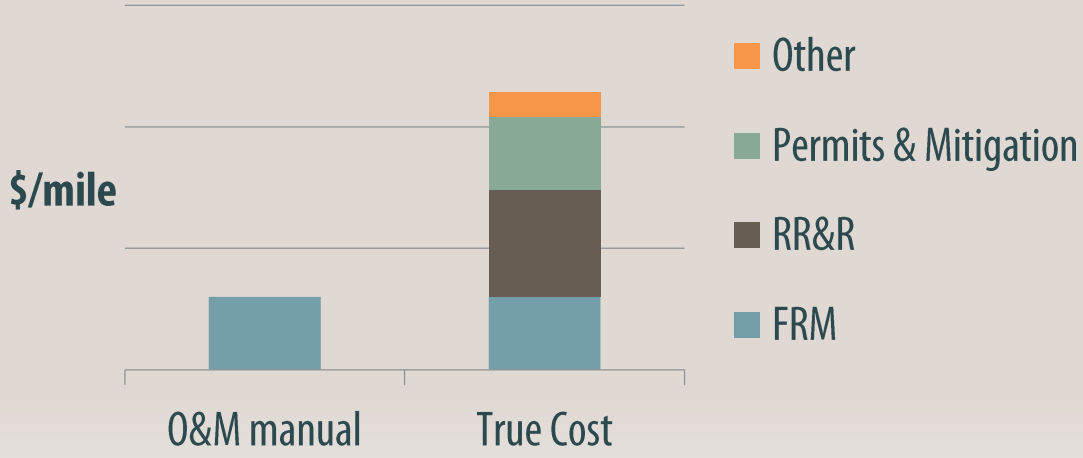
- OMRR&R activities are underfunded/under budgeted
- Requirements are more extensive than original assurances
- Nonstandard reporting/tracking – many inconsistencies (example: AB 156)
- Many gaps in available data (example: sediment removal)
- Labor is the most significant factor affecting LMA costs
- Transactional costs can be very high, but vary greatly
- Pipe replacement and inspections will be the major cost
- Higher expenditures does not necessarily mean higher rating (inspections)
- Some outcomes were surprising (example: setback levee long-term cost)

Recommendations

Path Toward Sustainable OMRR&R

Recommendations

What do we need to do?



Recommendations for Change

We need to…

- Identify, evaluate and take advantage of existing and new funding sources
- Identify indirect/general beneficiaries to spread the costs
- Address inadequate data/information and inconsistent tools:
  - Clearly define RR&R categories to develop adequate budget
  - Standardize AB 156 reporting
  - Perform additional evaluation of OMRR&R in the SJ Basin
  - Clearly define and track transactional costs
  - Consistently report environmental compliance needs

Recommendations for Change

We also need to…

- Improve public and policymaker awareness of OMRR&R importance and general benefit that the State realizes
- Reduce complex and fragmented governance structure
  - Overlapping jurisdictions and conflicting missions and priorities across various local, State, and federal agencies and tribal entities is a big problem that needs to be addressed
  - OMRR&R of multi-benefit components should be standardized and tracked to maximize effectiveness

Limitations, Applicability and Caveats of TM

- Great variability up and down the system (ex- table 6.1):
  - Condition of levees, channels and structures
  - OMRR&R activities and costs incurred
- Conservative but defensible estimates (conservative enough?)
- Costs are for planning purposes and can be applied as needed to provide a relative cost difference when comparing configurations for the 2017 CVFPP Update
- Some "replacement" costs were not applicable
- The workgroup expects to gain further understanding of problems, refinement of costs and confirmation of findings through future case studies

Proposed Next Steps

- Continue Workgroup efforts
- Revise Technical Memorandum (incorporate comments)
- Identify implementable actions that will be included in the 2017 CVFPP Update, including:
  - Specific recommendations
  - Necessary studies
  - Evaluate other success stories/ongoing programs (i.e. Louisiana, Netherlands)
  - Evaluate transactional costs in greater detail
  - Identify overall beneficiaries (e.g. State versus only local)
  - Improved AB 156 reporting
  - How to improve inspection results

Questions?

Where We're Going

Basin-Wide Feasibility Study Atlases: Update

Multiple Atlas Volumes Planned

Sacramento River Basin

Volume 1: Lower Sacramento River

- Chapter 1 – Yolo Bypass, Cache Creek, Willow Slough Bypass, DWSC
- Chapter 2 – American River
- Chapter 3 – Sacramento River below Fremont Weir

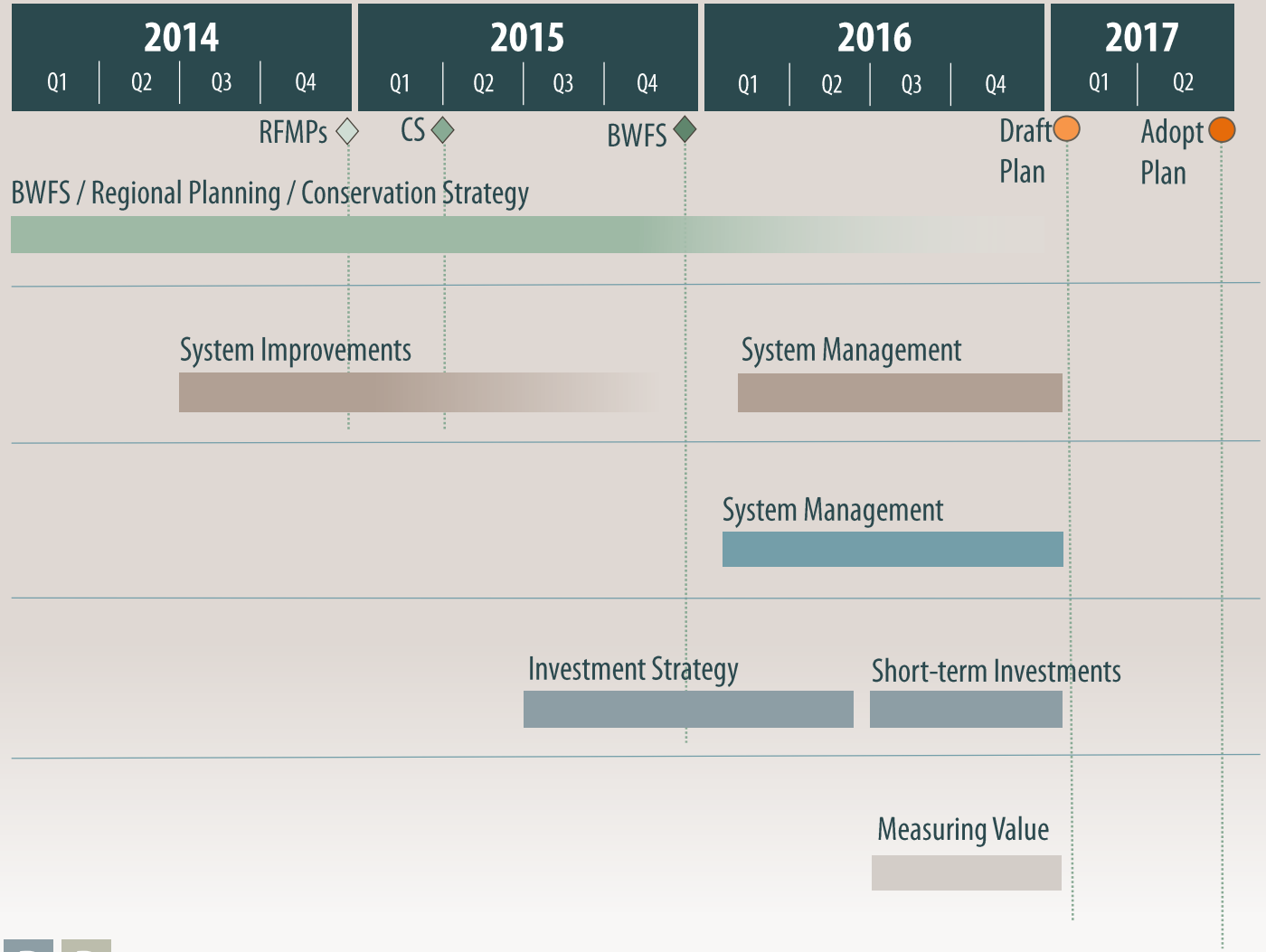
Volume 2: Mid-Upper Sacramento River/Feather River Region

- Chapter 4 – Sacramento River above Fremont Weir
- Chapter 5 – Sutter Bypass
- Chapter 6 – Feather, Yuba and Bear Rivers, inclusive of SPFC Tributaries

San Joaquin River Basin

- To be determined, Spring 2015

CVFPP Progression (as of March 2015)



Proposed Future CVFPP Updates

Regular CVFPB, Coordinating Committee and public updates planned:

Venue	Date	Proposed Topic
CVFPB Meeting	March 27, 2015	CVFPP Update – Communications & Engagement Overview
Coordinating Committee Meeting	April 22, 2015	Basin-Wide Feasibility Study Atlases: Update

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